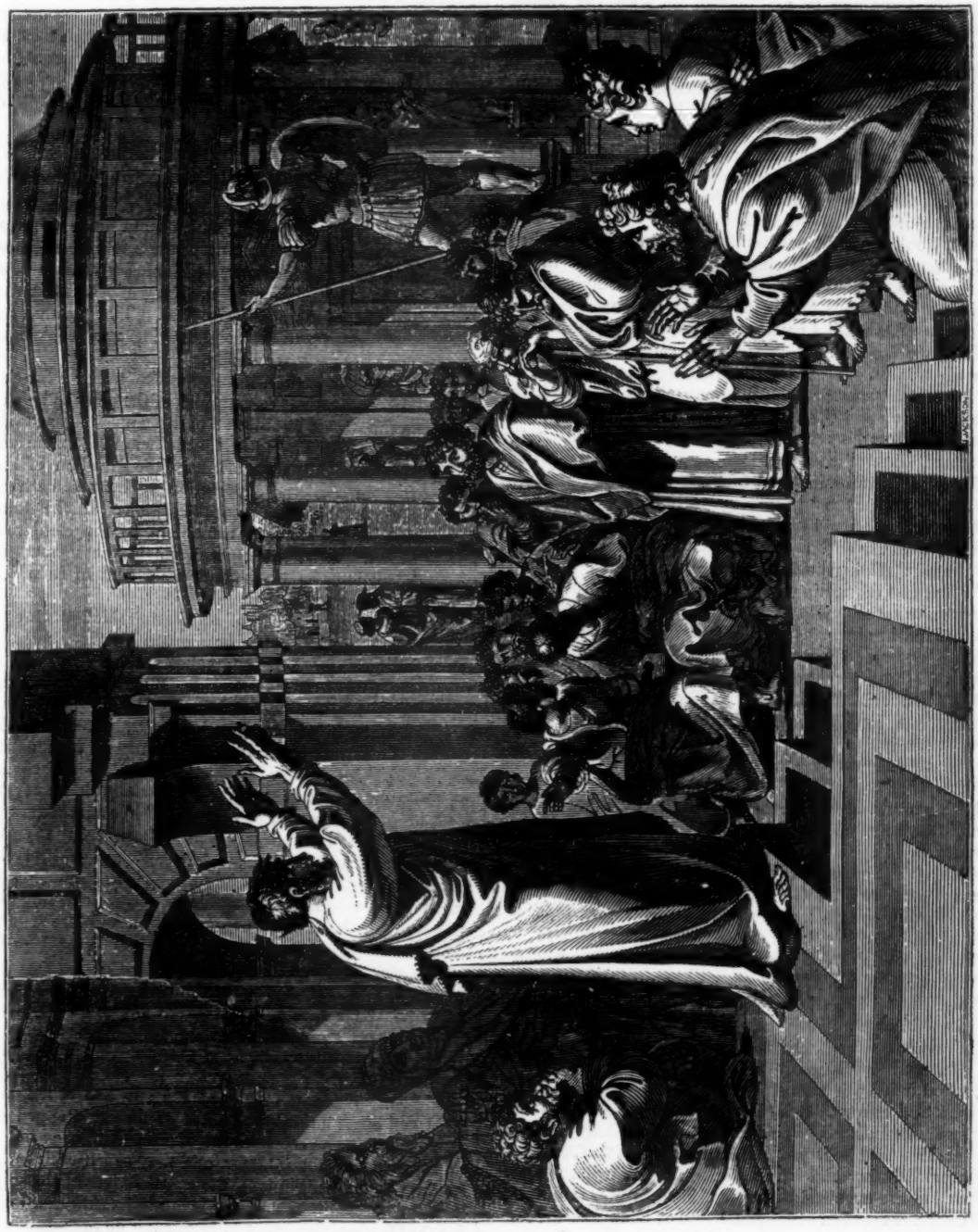
THE PENNY MAGAZINE

OF THE

Society for the Diffusion of Useful Knowledge.

51.] PUBLISHED EVERY SATURDAY. [JANUARY 19, 1833

THE CARTOONS.—No. 2.



[PAUL PREACHING AT ATHENS.]

PAUL PREACHING AT ATHENS.

ONE of the leading excellences of Raffaelle is the clear and perspicuous arrangement of his subject. Even Michael Angelo, notwithstanding his astonishing power in the invention of single groups, is comparatively deficient in the conduct of a whole composition; and this remark will apply more or less to all the masters of the Roman school, if put in competition with Raffaelle. The Venetian painters, with the exception of Titian, sacrificed, without scruple, sentiment, propriety, and character, for the sake of dazzling the eye. We are enabled by this species of comparison to appreciate more fully the excellence of Raffaelle, whose compositions, although he never sacrifices the higher to the more superficial qualities of art, present us with the richest and most picturesque combinations. A fine example of this excellence is furnished in the Cartoon of Paul preaching at Athens, engraved in the present number. This work, regarded merely as a composition of lines, and without adverting to the sentiment of it, is a finished example of laborious and beautiful arrangement; but when we consider it in reference to character, expression, and the manner in which the story is told, we are almost tempted to think that it holds the first place even among the productions of Raffaelle himself.

St. Paul, having been challenged by the philosophers of Athens to a public declaration of his doctrines in the Areopagus, has ascended the steps of a temple, where with uplifted hands he makes the solemn announcement, Ye men of Athens! I have seen in your city an altar to the Unknown God, Him I declare unto you! His discourse involves in its general tenor all the leading points of the Christian dispensation,—the immortality of the soul, the resurrection, and the redemption. The effect produced on his auditory is such as might be anticipated from the promulgation of a doctrine so new and so important. The persons who surround him are not to be considered a mere promiscuous assemblage of individuals. Among them, several figures may each be said to personify a class; and the different sects of Grecian philosophy may be easily distinguished. Here the Cynic, revolving deeply, and fabricating objections; there the Stoic, leaning on his staff, giving a steady but scornful attention, and fixed in obstinate incredulity; there the disciples of Plato, not conceding a full belief, but pleased at least with the beauty of the doctrine, and listening with gratified attention. Farther on is a promiscuous group of disputants, sophists, and free-thinkers, engaged in vehement discussion, but apparently more bent on exhibiting their own ingenuity than anxious to elicit truth or acknowledge conviction. At a considerable distance in the back-ground are seen two doctors of the Jewish law, who have listened to the discourse, rejected the mission, and turned their backs on the speaker and the place. On the first glance at the cartoon the eye is arrested by the figure of St. Paul, which the painter has invested with every circumstance which can give it dignity and importance. We learn from the Apostle himself that his exterior was not imposing; but Raffaelle, knowing that painting can express its meaning only through the medium of form, has departed from the literal fact, and given him an appearance corresponding to the sacredness of his character. He stands in front, on an elevated site, and considerably apart from his audience. His action unites the almost incompatible qualities of sedateness and energy. It is simple and majestic, but kindled by divine enthusiasm; and we are at once impressed with the idea that he is pouring forth a torrent of eloquence overwhelming and irresistible. The immediate effect, as well as the eventual triumph of his doctrine, is intimated by the conversion of Damaris, and of Dionysius the Areopagite, the foremost persons in the picture, who announce, with impassioned looks and gestures, their renunciation of idolatry, and acceptance of the Christian faith.

The buildings which occupy the back-ground (although betraying some inconsistencies in point of architectural style) are in themselves beautiful objects; but they are immediately connected with the subject, being the temples of the Pagan deities, whose idolatrous worship the Apostle is denouncing. These edifices may be considered also, together with the statues which surround them, to characterize the city of Athens, the mother of arts, and the seat of taste, wealth, and splendour. Throughout the works of Raffaelle, in the subordinate as well as the principal parts, we perceive the same penetrating intelligence; and these Cartoons especially, beyond any works of art extant, may be pronounced to be abstractions of pure intellect. We cannot forbear repeating a wish which we have already expressed, that when the new National Gallery is finished, these noble works may be removed to it: if it may be hoped that a taste for historic art will ever be created in this country, we can imagine nothing more likely to promote that object, than giving the public opportunity for the habitual contemplation of the Cartoons.

ÆSCHYLUS.

WE have already presented our readers with an extract from one play of Æschylus, which may serve to give some idea of his style. We now propose to give another from the play of the Persians, which was written a few years after the destruction of the navy of Xerxes in the great sea-fight of Salamis, B.C. 480. The position of Salamis, with respect to the neighbouring coast of Attica, may be seen in any correct map.

In the Greek tragedies, it was not the practice for the main event, or the great catastrophe, of the piece to be exhibited on the stage; but instead of this a messenger comes in, and tells the story. Atossa, the mother of Xerxes, while waiting in the royal palace of Susa (the Shushan of the Scriptures) in anxious expectation to hear something about her son, receives the intelligence of the total destruction of the Persian armament by the combined Grecian fleet. After this announcement the messenger proceeds to describe that memorable conflict in which Æschylus himself was engaged.

Messenger. The cause of all the mischief, O Queen, was an evil-minded spirit or dæmon coming, nobody knows wherefrom. For a Greek from the army of the Athenians told your son Xerxes, that as soon as the darkness of black night came, the Greeks would not stay, but springing on the benches* of their ships would seek to save their lives by stealthy flight, each as he best could. As soon as Xerxes heard this, not discovering the guile of the Greek, nor the malevolence of the God, he gives these orders to all the commanders of ships:—When the sun has ceased to burn the earth with his rays, and darkness has filled the circuit of the heavens, place a compact body of ships in three lines to watch the outlets and the narrow passes in which the waters roar.—And other ships he bade them place around the island of Ajax (Salamis); and should the Greeks avoid a wretched fate by a stealthy flight in their ships, the sentence was that every captain should lose his head. Thus he spake with a heart full of pride, for he knew not what was coming from the Gods. Not reluctant, but with obedient spirit, they got ready their evening meal, and every seaman strung his oar to the well-fitted peg. When the light of the sun had faded, and night had come on, every master of an oar stepped on shipboard, and every man at arms. And each line of ships called to its neighbour, and they sailed each in his station; and all night long the commanders of the ships kept the naval force cruising about. Night passed on; but the Grecian armament were making no preparation to escape in secret. For soon as Day with his white horses

* The ships, or rather long boats, were worked by oars.

spread over the white earth, gloriously bright to behold, with a loud noise sprung a joyful shout like a song from the Greeks, and at the same time Echo called out in reply from the island rocks. Fear fell on the barbarians who were balked in their hopes, for the Greeks sung then the sacred pæan, not as if they thought of flight, but like men rushing to the battle with courageous daring. And the trumpet with its voice urged them on. With the well-timed stroke of the dashing oar they beat the roaring sea to the word of command, and quickly the whole fleet was full in view. First came the right wing in good array; behind followed all the fleet, and now we heard the sound of many voices: *Sons of the Greeks, advance, save your native land, and save your children and your wives, and the temples of your fathers' gods, and your fathers' tombs: now you fight for all.* On our part a shout in the Persian tongue replied; and the moment of action was no longer delayed. Straightway ship dashed against ship with its brazen beak: a Grecian ship began the conflict and broke off the head of a Phœnician galley; and each drove his ship against his adversary. At first the tide of the Persian army resisted; but when the ships were crowded in a narrow space, and there was no help from one another, then were they struck by the brazen-armed beaks of friendly ships, their oars were broken and swept away, while the Grecian ships skilfully attacked them on all sides. And the hulls of ships were turned bottom upward, and the sea could no longer be seen, so full was it of wrecks and human bodies. The shores too and the rocks that heaved their backs above the waves were full of the dead, and every ship of the barbarian army was urged along by the rowers in unseemly flight. But the Greeks, as the fishermen do with tunnies or a cast of fish, struck the floating wretches with fragments of oars, and pieces of wreck, and cleft them in twain; and groans with shrieks overspread the surface of the sea, till the eye of dark night took them away. But the fulness of our evils, even were I to go on telling for ten days in succession, I could not measure out to thee; for be well assured that never before did so many men die on one day.

CHEAP BOOKS.

[The ninth number of the 'Quarterly Journal of Education' contains the following statements, in illustration of the principle upon which books in large demand may be sold at a very low price.]

It has been well observed in the posthumous work of an acute thinker, Chenevix, that "the bent of civilization is to make good things cheap." We will endeavour to explain this as regards printing, by a few facts, to show that the extension of the market, whilst it diminishes price, does not deteriorate quality.

There are certain expenses of a book which are permanent, whatever number be sold. These expenses are—

1. Authorship.
2. Embellishments.
3. Composition of types, including stereotype plates, if that process be employed.
4. Advertising.

Now, it must be evident, if 1000 purchasers co-operate to pay those permanent expenses, the proportion to each purchaser can only be half as much as if there were only 500 purchasers. Take an octavo volume, for example, and assume the following items of expense:—

Author	£200
Artist	50
Composition of types	75
Advertising	50
	£375

If 500 copies only of this octavo volume be estimated to be sold, the price which the publisher must fix upon it must be such as to cover an outlay, to be incurred in such permanent expenses alone, of 15*s.* per copy;—if 1000 copies be estimated to be sold, the expense of these items upon each copy is reduced to 7*s.* 6*d.*; if 2000, to 3*s.* 9*d.*; if 3000, to 2*s.* 6*d.* The greater, therefore, the probable number of purchasers, the cheaper the book can be sold. It is the province of the publisher rightly to calculate these chances. If he fix a high price, and have a large sale, there are great profits to the publisher, and in many cases to the author; if the high price so fixed, or any other cause, prevent a large sale, the profits are small, or there is a loss;—if a low price is fixed, and the sale be at the same time small, the losses are considerable. It is this uncertainty which renders the business of publishing so much a matter of speculation; and in this respect it is a very unsatisfactory business to those who follow it.

Let us apply this principle to such a work as the Penny Magazine. We will take the permanent expenses at 40*l.*, for a single number. These are the expenses, be it remembered, which are incurred whether 200 or 200,000 copies are sold—the expenses previous to the employment of a single sheet of paper or a single hour's labour in printing off the copies. Forty pounds contain 9600 pence; so that if 10,000 copies only were sold, the publisher would give away his paper and print, and pay the profit of the retailer. At that rate of sale a penny magazine must of necessity be a two-penny magazine, or the work could not go on without the subscriptions of individuals. But if 20,000 purchasers co-operate to pay the 9600 pence, the penny that formerly bore upon each copy is reduced to a halfpenny; if 40,000 co-operate, it is reduced to a farthing. But the sheet of paper and the printing off still cost somewhat more than a halfpenny—and as the various wholesale and retail dealers who manage the sale are allowed about forty per cent., the paying point is not yet reached;—it begins at about 60,000 or 70,000; and after that sale there is a profit. A sale of 60,000 or 70,000 is therefore essential to the commercial existence of such a work as the Penny Magazine;—that is, that number of purchasers must co-operate to pay the expenses which are absolutely necessary to be incurred before a single copy is sold.

MINERAL KINGDOM.—Section 2.

In furtherance of the design expressed in our last number, we now proceed to lay before our readers a brief general outline of the leading doctrines of geology, such as they are now generally received. The term is derived from two Greek words meaning a *discourse* (logos), respecting the *earth* (gea), and we have already explained the objects of inquiry which this department of science comprehends. In giving this outline it must be borne in mind that it is not our purpose to give even an elementary treatise on geology, but solely to render our descriptions of some of the principal mineral productions that we meet with in common life more intelligible. We mean to confine ourselves to the great general truths which have been discovered, and that, too, without entering upon any detail of the proofs and reasonings upon which these have been established: to have gone into these, so as to serve any useful purpose, would have required us to enter into discussions inconsistent with the plan of our publication. If, therefore, some of our statements shall seem startling, and even improbable, as they are very likely to do to such of our readers as come new to the consideration of the subject, they must either give us credit for advancing nothing but what is admitted by men of science as an established truth, or they must take the trouble to investigate the subject for themselves, and satisfy their doubts by applying at the original sources of information. We shall avoid, as much as possible, the employment of terms that are not likely to be understood by the generality of readers; but we may be sometimes unable entirely to fulfil our wish in that respect, especially in naming rocks and minerals. To give by words alone such a description of a stone that a true image of it can be presented to the mind of the reader, is impossible; the substance itself must be seen: but it is not necessary for our present purpose that more should be known about mineral bodies, than what it is in the power of every one who will look a little about him in the ordinary course of life.

It may be necessary to remind our readers that the earth is a round body of a somewhat flattened shape, the diameter from pole to pole being about twenty-seven

miles less than that passing through the equator; that more than three-fifths of its surface is covered by the ocean; that the land rises from the surface of the sea in the form of islands and of great continuous masses called continents, without any regularity of outline, either where it comes in contact with the water, or in vertical elevation,—its surface being diversified by plains, valleys, hills, and mountains, which sometimes rise to the height of twenty-six thousand feet above the level of the sea. Numerous soundings in different parts of the world have shown that the bottom of the ocean is as diversified by inequalities as the surface of the land: a great part of it is unfathomable to us, and the islands and continents which rise above its surface, are the summits of mountains, the intervening valleys lying in the deepest abysses.

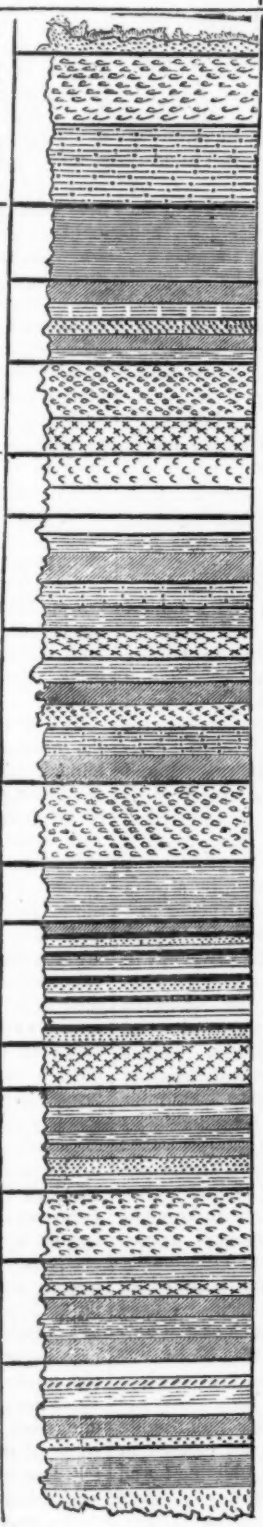
Different climates produce different races of animals, and different families of plants; but the mineral kingdom, as far as the nature of stone is concerned, is independent of the influence of climate, the same rocks being found in the polar and in the equatorial regions. Although there is considerable diversity in the structure of the earth, it is not in any degree connected with particular zones, as far as relates to circumstances which are external to it; nor can we say that the wonderful action which burning mountains tell us is going on in its interior, is confined to any part of the sphere, for the volcanic fires of Iceland burn as fiercely as those that burst forth under the line. From all the observations hitherto made, there is no reason to suppose that any unexplored country contains mineral bodies with which we are not already acquainted; and although we cannot say beforehand of what rocks an unexamined land is likely to be composed, it is extremely improbable that any extensive series of rocks should be found, constituting a class different from any which have been already met with in other parts of the globe.

When we dig through the vegetable soil, we usually come to clay, sand, or gravel, or to a mixture of these unconsolidated materials; and, in some countries, we shall probably find nothing else, at the greatest depths to which we are able to penetrate. But in most places, after getting through the clay and gravel, we should come upon a hard stone, lying in layers or beds parallel to each other, either of one kind or of different kinds according to the depth; and which would vary in different countries, and in different places in the same country, as well in its constituent parts, as in the thickness, alteration, and position of its beds or layers. It has been ascertained by the observations of geologists, in various parts of the world, that the crust of the earth is composed of a series of such layers, distinguishable from each other by very marked characters in their internal structure. The elements of which they are composed are not very numerous, being for the most part the hard substance called quartz by mineralogists, of which gun-flints may be cited as a familiar example, these being wholly composed of it, and the well-known substances, clay and limestone; but these elements are aggregated or mixed up together in so many proportions and forms, as to produce a considerable variety of rocks. Besides this elementary composition, or what may be termed their *simple* structure, the greatest proportion of the rocks that are so arranged in layers contain foreign bodies, such as fragments of other rocks, shells, bones of land and amphibious animals and of fishes, and portions of trees and plants. It has further been found that these different layers or *strata*, as they are scientifically called (from the plural of the Latin word *stratum*, signifying a bed), lie upon each other in a certain determinate order, *which is never, in any degree, inverted.* Suppose the series of strata to be represented by the letters of the alphabet, A being the stratum nearest the surface, and Z the lowest: A is never found *below* Z nor under any other of the intervening letters; nor is Z ever found *above* any of the letters that stand before it in the alphabet; and so it is with all the strata represented by the other letters. This will be rendered more clear by the annexed diagram, which is an imaginary section of the crust of the globe, representing a series of different strata. On one side there is a general description of the nature of the stone; on the other the name of some particular place where that stratum is to be seen. It must not however be imagined, although this regularity *in the order* of superposition exists, that all the different members of the series always occur together; on the contrary, there is no instance where they have all been found in one place. It possibly may happen that where C is found in a horizontal position, by going deeper all the rest would follow in succession, but this we can never know, as the thickness would be infinitely beyond our means of penetrating; and there are reasons which render the existence of such an uninterrupted series extremely improbable. It very seldom happens that more than three or four members *of the series* can be seen together;—we say of the series, because each member is composed of an almost infinite number of subordinate layers. This order of succession, established by geologists, has been determined by the combination of many observations made in different countries at distant points. The order of three or four members was ascertained in one place; the *upper* stratum in that place was found to be the lowest member of a second series in another place, and the *lowest* stratum at the first station was observed to be the uppermost at a third point; and in like manner the order of superposition was discovered throughout the whole range. Neither is it to be supposed that the strata which lie next each other in the diagram are always so in nature; as for instance, that wherever G is found associated with another member it is always either with F above it or H below it. it very often happens that F lies upon H, G being altogether absent; and C may even be seen lying on R, the whole of the intervening members of the series being wanting. Very frequently one of the lowest members of the series appears at the surface. Every one knows that sometimes chalk, sometimes slate, lies immediately beneath the vegetable soil, or even at the surface without that scanty covering; but if a lower member of the series represented in the diagram be seen at the surface, however deep we might go, we should never find any one of those rocks that belong to the higher members of that series. The immense practical advantage of this knowledge of the determinate order of succession will be seen at once; for if O, or any of the lower members of the series, were found to occupy the surface of the country, it would be at once known that all search for coal in that spot would be fruitless.

Our readers will doubtless be curious to know by what means geologists have been enabled so decidedly to fix the above order of succession. If they had had nothing to depend upon but the mineral composition of the rock, (what we have termed its simple structure), they would never have arrived at this knowledge; for as far as that is concerned, rocks are met with among the upper members of the series, which cannot be distinguished from those in the lower beds. They have arrived at the important conclusion by a far less fallible guide; for every stratum contains, within its own domain, records of its past history, written in characters intelligible to all nations, which no possible events can falsify or destroy, and which have enabled the geologists to arrive at some conclusions possessing all the certainty of mathematical demonstration. But to keep within our prescribed limits, and at the same time avoid the inconvenience of breaking off in the midst of this subject, we must defer to our next paper on the Mineral Kingdom the account of these curious documents of the ancient history of the earth.

(DIAGRAM, No. 1.)

ORDER OF SUCCESSION OF THE DIFFERENT LAYERS OF ROCKS WHICH COMPOSE THE CRUST OF THE EARTH.



	Nature of the different kinds of Rocks and Soils.	Instances where they are found.
	A. Vegetable soil	
	B. Sand, clay, gravel, with bones of animals of same species as now exist	Mouth of Thames and other rivers.
	C. Deep beds of gravel, large loose blocks, sand—all containing bones of animals belonging to species now extinct	Surface of many parts of England, and especially the eastern and south-eastern parts.
Tertiary Strata.	D. Sand, clay, pebbles, beds of hard white sandstone—many sea shells, bones of extinct species of animals	Hampstead Heath, Bagshot Heath, coast of Suffolk and Norfolk—stone of which Windsor Castle is built.
Tertiary Strata.	E. Alternations of limestones, containing fresh-water shells, clays of different qualities, and limestones containing marine shells.	Isle of Wight.
Tertiary Strata.	F. Thick beds of clay, with many sea shells; beds of limestone—remains of extinct species of plants and fruits, land and amphibious animals	Many places round London, great part of Essex, and north-east of Kent, Isle of Sheppey.
Secondary Strata.	G. Chalk with flints	Woolwich, Cliffs at Harwich, Isle of Wight.
Secondary Strata.	G. Chalk without flints	Dover Cliffs, Brighton, Hertfordshire.
Secondary Strata.	H. *a.* Chalk marl	Flamborough Head in Yorkshire.
Secondary Strata.	H. *b.* Green sand	Many parts of south coast, Kentish rag.
Secondary Strata.	H. *c.* Thick beds of clay	Many parts of Kent and Sussex.
Secondary Strata.	H. *d.* Yellow sand, with beds of iron ore	The Weald of Kent, Surrey, and Sussex.
Secondary Strata.	H. *e.* Argillaceous sandstone	Neighbourhood of Hastings and Isle of Purbeck.
Secondary Strata.	I. *a.* Limestones of different qualities	Flat pavement of London, very often.
Secondary Strata.	I. *b.* Beds of clay	Portland building stone.
Secondary Strata.	I. *c.* Limestones with corals	Kimmeridge, on coast of Dorsetshire.
Secondary Strata.	I. *d.* Beds of clay	Neighbourhood of Oxford.
Secondary Strata.	I. *e.* Thick beds of limestone	Extensively in Lincolnshire fen clay.
Secondary Strata.	I. *f.* Thin beds of limestone and slaty clay	Bath building stone.
Secondary Strata.	K. Red marly sandstone, often containing beds of alabaster or plaster-stone, and beds of rock salt	Whitby, Gloucester, Lyme Regis.
Secondary Strata.	L. Limestone containing much magnesia	Great part of East Yorkshire, Nottinghamshire, Stafford, Warwick, Worcester, Cheshire, and neighbourhood of Carlisle.
Secondary Strata.	M. Coal Measures, containing various seams of coal—beds of ironstone, clay, sandstone, and freestones of various qualities	Sunderland, Ferrybridge in Yorkshire, Mansfield, Notts.
Secondary Strata.	N. Coarse sandstone and slaty clay	Newcastle, many parts of Yorkshire, Lancashire, Staffordshire, Somersetshire, vale in which Edinburgh and Glasgow are situated, South Wales.
Secondary Strata.	O. Thick beds of limestone, and slaty clay and sandstone, in many alternations	Millstones of Newcastle and Derbyshire.
Secondary Strata.	P. Dark red sandstone, with many beds of pebbles	Deposits of the lead ore of Derbyshire, Yorkshire, Northumberland, Cumberland, High Peak of Derbyshire, mountains in Yorkshire, Mendip Hills, Somerset.
Secondary Strata.	Q. Thick beds of slate and sandstone, with sometimes impressions of shells, with thick beds of limestone	Great part of Herefordshire, and south-east part of South Wales, Banks of the Wye, south of Scotland.
Primary Strata.	R. Slates and many hard rocks lying in alternating beds, in which no trace of animal remains has been found, of great thickness, and the lowest that have been reached	Cumberland and Westmorland Mountains, great part of Wales, north of Devon, South Devon, and Cornwall, great part of south of Scotland.
Primary Strata.		Chief part of the Highlands of Scotland.

A PARTY OF EMIGRANTS TRAVELLING IN AFRICA.

IN the year 1820, about 5000 British emigrants were conveyed to South Africa, under the patronage of Government, with a view to colonize certain tracts of unoccupied territory near the frontier of Cafferland, on the eastern extremity of the Cape Colony. The emigrants were disembarked at Algoa Bay, about 600 miles from Cape Town; and there encamped under their respective leaders, until they could be furnished with waggons to convey them and their goods into the interior. None of the parties consisted of fewer than ten adult males, besides women and children; and some amounted to as many as a hundred families or upwards, associated for mutual support, and accompanied by their respective clergymen, or other religious instructors. A considerable number of gentlemen of education and intelligence, (chiefly military and naval officers on half pay,) were also among the leaders; so that the new settlement comprised within its own body suitable materials for the immediate formation of a well-organized community. The history of this settlement, however, though neither uninteresting nor uninstructive, is not our present object. We mean merely to give the reader a sketch of one of those parties journeying through the wilds of Africa to their remote location in the interior.

The writer of this notice happened to be the leader of the band now referred to, which was one of the smallest of that body of emigrants. It consisted of a few families of Scottish farmers, amounting altogether to twenty-three persons, including children and servants.

We struck our tents at Algoa Bay on the 13th of June, which is about the middle of winter in the southern hemisphere. The weather was serene and pleasant, though chill at night—somewhat like fine September weather in England. Our travelling train consisted of seven waggons, hired from Dutch-African colonists, and driven by the owners or their native servants—slaves and Hottentots. These vehicles appeared to be admirably adapted for the country, which is rugged and mountainous, and generally destitute of any other roads than the rude tracks originally struck across the wilderness by the first European adventurers. Each waggon was provided with a raised canvas tilt to protect the traveller from sun and rain; and was drawn by a team of ten or twelve oxen, fastened with wooden yokes to a strong central trace, or *trek-tow*, framed of twisted thongs of bullock's or buffalo's hide. The driver sat in front to guide and stimulate the oxen, armed with a whip of enormous length; while a Hottentot or Bushman boy, running before, led the team by a thong attached to the horns of the foremost pair of bullocks. Where the road was bad and crooked, or when we travelled at a rapid rate, as we frequently did on more favourable ground, these poor leaders had a very toilsome task; and if they made any mistake, or in aught displeased the lordly *baas* (the gruff boor who sat behind), his formidable lash was not unfrequently applied to their naked limbs. These African whips are truly tremendous implements. In ascending some of the mountain passes, when the whole strength of the oxen, and occasionally of two or three teams yoked together, was required to drag up our heavy-loaded waggons, the lash was used with such unsparing vigour that the flanks of the bullocks were sometimes actually streaming with blood.

These rude African farmers, however, have their good points. Their faults and vices, so far as they are peculiar, are evidently the effect of their unfortunate situation in being slave-holders. When not crossed in their humour, they are usually civil and obliging; and we continued on friendly terms with them to the end of our journey.

At the close of the first day, we encamped in the midst of an immense forest, or jungle, of shrubbery, at the distance of a few miles from a remarkable salt lake which has been described in a previous number. This we visited in order to provide ourselves with a supply of salt for culinary purposes. Our encampment this night was to our yet unexperienced eyes rather a singular scene. Some families pitched their tents, and spread their mattresses on the dry ground; others, more vividly impressed with the terror of snakes, scorpions, tarantulas, and other noxious creatures of the African clime, resolved to sleep as they had travelled—above their baggage in the waggons. Meanwhile our native attendants adopted due precautions to avert surprise from the more formidable denizens of the forest. Elephants and lions had formerly been numerous in this part of the country, and were still occasionally met with. Two or three large fires were therefore kindled to scare away such visitants; and the oxen, for greater security, were fastened by their horns to the wheels of the waggons. The boors unslung their huge guns (or *roers*, as they called them) from the tilts of the waggons, and placed them against a magnificent evergreen bush, in whose shelter, with a fire at their feet, they had fixed their place of repose. Here, untying each his leathern scrip, they produced their provisions for supper, consisting chiefly of dried bullock's flesh, which they washed down with a moderate *sopie*, or dram, of colonial *brandwyn*, from a huge horn slung by each man in his waggon beside his powder-flask. The slaves and Hottentots, congregated apart round one of the watch-fires, made their frugal meal, without the brandy, but with much more merriment than their phlegmatic masters. In the meanwhile our frying-pans and tea-kettles were also actively employed; and by a seasonable liberality in the beverage "which cheers but not inebriates" we ingratiated ourselves not a little with both classes of our escort, especially with the coloured caste, who prized "tea-water" as a rare and precious luxury.

It was not a little amusing after supper to contemplate the characteristic groups which our rustic camp exhibited. The Dutch-African boors, most of them men of almost gigantic size, sat apart in their bushy *bield*, in aristocratic exclusiveness, smoking their huge pipes with self-satisfied complacency. Some of the graver emigrants were seated on the trunk of a decayed tree, conversing in broad Scotch on subjects connected with our settlement, and on the comparative merits of long and short-horned cattle (the horns of the native oxen are enormous): and the livelier young men and servant lads were standing near the Hottentots, observing their merry pranks, or practising with them a lesson of mutual tuition in their respective dialects; while the awkward essays at pronunciation, on either side, supplied a fund of ceaseless jocularity. Conversation appeared to go on with alacrity, though neither understood scarcely a syllable of the other's language; and a sly rogue of a Bushman sat behind, all the while, mimicking, to the very life, each of us in succession. These groups, with all their variety of mien and attitude, character and complexion,—now dimly discovered, now distinctly lighted up by the fitful blaze of the watch-fires; the exotic aspect of the clumps of aloes and euphorbias, peering out amidst the surrounding jungle, in the wan light of the rising moon, seeming to the excited fancy like bands of Caffer warriors crested with plumes and bristling with assagais; these appearances, together with the uncouth chuckling gibberish of the Hottentots and Bushmen, and their loud bursts of wild laughter, had altogether a very strange and striking effect, and made some of us feel far more impressively than we had yet felt, that we were now indeed houseless pilgrims in the wilds of savage Africa.

By degrees, the motley groups became hushed, under the influence of slumber. The settlers retired to their

tents or their waggons; the boors, sticking their pipes in their broad-brimmed hats, wrapt themselves in their great coats, and fearless of snake or scorpion, stretched their huge bodies on the bare ground; and the Hottentots, drawing themselves each under his sheep-skin *caross*, lay coiled up, with their feet to the fire and their faces to the ground, like so many hedgehogs. Over the wide-stretching wilderness, now reposing under the bright midnight moon, profound silence reigned,—unbroken save by the deep breathing of the oxen round the waggons, and, at times, by the far-off melancholy howl of a hyæna, the first voice of a beast of prey we had heard since our landing. With the nightly serenade of the jackal and hyæna we soon became familiar; nor did any more formidable visitants disturb our repose during our journey

[To be continued.]

MY BIRTH-DAY.

"My birth-day!"—What a different sound
That word had in my youthful ears!
And how, each time the day comes round,
Less and less white its mark appears!

When first our scanty years are told
It seems like pastime to grow old;
And, as youth counts the shining links
That Time around him binds so fast,
Pleased with the task, he little thinks
How hard that chain will press at last.

Vain was the man, and false as vain,
Who said, "were he ordained to run
His long career of life again,
He would do all that he *had* done."—
Ah! 'tis not thus the voice that dwells
In sober birth-days speaks to me;
Far otherwise—of time it tells
Lavished unwisely, carelessly—
Of counsel mock'd—of talents, made
Haply for high and pure designs,
But oft, like Israel's incense laid
Upon unholy, earthly shrines—
Of nursing many a wrong desire—
Of wandering after Love too far,
And taking every meteor fire
That cross'd my path-way for his star!
All this it tells, and could I trace
The imperfect picture o'er again,
With power to add, retouch, efface
The lights and shades, the joy and pain,
How little of the past would stay!
How quickly all should melt away—
All—but that freedom of the mind
Which hath been more than wealth to me:
Those friendships in my boyhood twined,
And kept till now unchangingly.
And that dear home, that saving ark,
Where Love's true light at last I've found,
Cheering within, when all grows dark,
And comfortless, and stormy round!

MOORE.

LORD BACON.

THE twenty-second of January is the birth-day of the illustrious FRANCIS BACON, whom we are here to regard principally as the founder of the Experimental or Inductive Philosophy. There can be no doubt that the whole of men's knowledge of external nature must have been originally derived from observation. We are not born with any idea even of such simple truths as that a stone is hard, and that it will fall to the ground if dropped from the hand. These and all other facts must have been observed before they could be known. Observation, then, and that alone, was the mother of natural philosophy. First, so many separate facts were collected; then, they were arranged into different groups according to certain characters which were found to be common to all those that were placed together; and in this way were obtained what we call the general truths of science, which are nothing more than expressions of such common principles. We need no historical evidence to prove that this was the course actually followed for it evidently must have been so: there was no other way by which the general truths in question could have been arrived at. It is possible, however, that in a succeeding age these general truths might in many cases be proclaimed without the particular instances on which they were founded. In this way philosophy would at length put on the air of a body of broad and lofty abstractions, not resting upon any visible foundation of experience. It is easy to conceive how difficult and almost impossible it would be for the truths thus separated from their proper support to remain long unmixed and unsophisticated.

We may thus account for the form which the philosophy of the ancients eventually assumed. In its most matured state it was undeniably, to a considerable extent, under the dominion of certain preconceived opinions, some true, others false, and others partly true and partly false, but of all of which it may be said that the evidence which was to establish or refute them was seldom sought for where alone it was really to be found—in the facts of nature. It would be extremely incorrect, however, to suppose that the examination of nature was altogether neglected. Very far from it. The most eminent of the Greek philosophers were most assiduous and most accurate observers. For proof of this, we need only refer to such works as Aristotle's History of Animals and the medical treatises of Hippocrates. The true distinction between them and the moderns is, that, although *observers*, they were not *experimenters*. They heard, and recorded correctly enough, what nature stated of her own accord, but they asked her no questions.

It is a most remarkable fact, and one vividly illustrative of the weakness and inefficiency of a philosophy so constituted, that for the long space of nearly two thousand years it not only remained unproductive, but actually went back and decayed every day more and more. From the age of Democritus, Hippocrates, and Aristotle, four hundred years before the birth of Christ, down to nearly the middle of the sixteenth century of our era, men, instead of making any progress in the method of prosecuting the study of nature, had been gradually sinking into deeper and deeper ignorance and blindness in regard to every thing appertaining to that branch of science. Accidental discoveries may have occasionally turned up to add a few items to their stock of facts, though not, there is reason to believe, to an extent sufficient to make up for those which were continually dropping away into forgetfulness; but of philosophy itself, properly so called, there was nearly all the while a decline like that of the daylight after the sun has sunk below the horizon. Certain general principles, sanctioned by the authority of great names, or the tradition of the schools, were considered as forming the necessary foundation of all truth. No attempt was made, or so much as thought of, to test these sacred affirmations by the actual investigation of nature: the aim was always to reconcile the fact to the doctrine, not the doctrine to the fact. At last the explication, and we might almost say the worship of these principles became nearly the sole occupation of the professors of philosophy; even the collecting of new facts by means of observation was entirely given up. This was the state of things during what are called the middle or the dark ages, which may be described as comprehending the thousand years from the taking of Rome by the Goths in the middle of the fifth century, to the taking of Constantinople by the Turks in the middle of the fifteenth.

After this last-mentioned event, and the revival of letters in the west, which was brought about mainly by the learned exiles whom the destruction of the Grecian empire forced to take refuge in Italy, the human intellect did indeed manifest a disposition, in almost all departments of science, to throw off the yoke of prejudice and authority to which it had so long resigned itself. In natural philosophy, as well as in other studies, various

intrepid and original thinkers arose, determined to make their way to the knowledge of truth by their own efforts, and to look into the realities of nature with their own eyes. These men well deserve to be accounted the pioneers of Bacon. But it was not till he arose, that the war against the old despotic formalities of the schools was commenced on any thing like a grand scale, or carried on with adequate vigour and system. It was he who actually effected the conquest—who dispersed the darkness and brought in the light. This he did by the publication of his 'Novum Organon Scientiarum,' or New Instrument of the Sciences.

Bacon was born in 1561, and was the son of Sir Nicholas Bacon, for more than twenty years keeper of the great seal. He was educated at Trinity College, Cambridge, after leaving which he entered himself a student of Gray's Inn, with the object of following his father's profession of the law. In this profession, and in public life, he rapidly rose to the highest eminence; and in 1619 he was made Lord High Chancellor of England, and created Baron Verulam, to which title was added, the following year, that of Viscount St. Albans. Bacon's political course, up to this time, had not been very remarkable for disinterestedness or independence; and it was destined to terminate suddenly in disgrace and sorrow. In March, 1621, he was impeached by the House of Commons for corruption in his high office; and his own confession soon after admitted the truth of the accusation in nearly all its force: on which he was immediately deprived of the seals, and sentenced to be fined, imprisoned during the King's pleasure, and for ever excluded from parliament and all public employments. He afterwards obtained a remission of the hardest parts of his sentence: but he only survived till the 9th of April, 1626, on which day he died suddenly at the Earl of Arundel's house at Highgate. Intellectually considered, he was so great a man, that his character and conduct, as an historical personage, are commonly, as it were by general consent, in a very singular degree overlooked and forgotten when we mention the name of Bacon. It is worthy of notice, as a curious evidence of how little the delinquencies and misfortunes of the politician, memorable as they were, were some time after his death known or noted in those parts of the world which were most filled with the fame of the philosopher, that Bayle, in his Dictionary, published in 1695, and again in 1702, has given us an article on Bacon, in which he does not so much as allude to his lamentable fall, being evidently ignorant that such an event had ever taken place.

The method of philosophy recommended and taught in the 'Novum Organon' is that of experiment and induction. Experimenting was a favourite employment of philosophers even in the dark ages. The chemists or alchemists, for instance, of those days, were continually making experiments. But their experiments were all made simply for the purpose of obtaining a particular material result; never with the object of detecting or testing a principle. Thus, they mixed or fused two or more substances together, in the hope that the combination might yield them the *elixir vitæ*, or the universal tincture; but they never resorted to a course of experiments to ascertain whether nature, as was asserted in the schools, really abhorred a vacuum, or to try the alleged incompressibility of water, or to bring to the proof any of the other commonly received dogmas of a similar description. It may be safely affirmed, that they never dreamed of experimental philosophy in this sense. Now this was the method of experiment to which Bacon called the attention of philosophical inquirers, and of which he first fully laid open the character, the uses, and the rules. By induction, again, he meant merely the bringing in or collecting of facts, and the assorting of them according to their bearings, for the purpose of thence deducing those inferences which properly constitute philosophy. Although the Baconian philosophy has been called the philosophy of induction, the phrase is to be taken as referring merely to the foundation on which it rests. Induction is not its object, but only one of its instruments; not its end, but its beginning. Its great author sufficiently expressed his sense of the true place which mere induction held in philosophy, when he used, as we are informed by his chaplain, Dr. Rawley, in his Preface to Bacon's 'Sylva Sylvarum,' to complain, in allusion to his task of collecting the facts in that work, that he, who deserved "to be an architect in this building, should be forced to be a workman and a labourer, and to dig the clay and burn the brick." But on the other hand, he held it to be essential that this work should be performed by some one. He maintained that no philosophical truth or general principle could be obtained by any other method than by the induction of facts, or was entitled to acceptance, except in so far as it was supported by that testimony. The fundamental tenet, in short, of his philosophy is announced in the opening sentence of the 'Novum Organon:'—"Man, the servant and interpreter of Nature, understands and reduces to practice just so much as he has actually experienced of Nature's laws; more he can neither know nor achieve."

[Portrait of Bacon.]

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's-Inn Fields.

LONDON:—CHARLES KNIGHT, PALL-MALL EAST.

Shopkeepers and Hawkers may be supplied Wholesale by the following Booksellers, of whom, also, any of the previous Numbers may be had:—

London, GROOMBRIDGE, Panyer Alley.
Bath, SIMMS.
Birmingham, DRAKE.
Bristol, WESTLEY and Co.
Carlisle, THURNAM; and SCOTT.
Derby, WILKINS and SON.
Devonport, BYERS.
Doncaster, BROOKE and Co.
Exeter, BALLE.
Falmouth, PHILP.
Hull, STEPHENSON.
Jersey, JOHN CARRE, Jun.
Kendal, HUDSON and NICHOLSON.
Leeds, BAINES and NEWSOME.
Lincoln, BROOKE and SONS.
Liverpool, WILLMER and SMITH.
Lynn, J. R. SMITH.
Manchester, ROBINSON; and WHEB and SIMMS.
Newcastle-upon-Tyne, CHARNLEY.
Norwich, JARROLD and SON; and WILKINS and SON.
Nottingham, WRIGHT.
Oxford, SLATTER.
Plymouth, NETTLETON.
Portsea, HORSEY, Jun.
Sheffield, RIDGE.
Staffordshire, Lane End, C. WATTS.
Worcester, DRIGHTON.
Dublin, WAKEMAN.
Edinburgh, OLIVER and BOYD.
Glasgow, ATKINSON and Co.
New York, JACKSON.

Printed by WILLIAM CLOWES, Stamford Street.